

Trizma® Buffers

Product Specification

[Tris(hydroxymethyl)aminomethane]

[Tris; THAM; 2-Amino-2-(hydroxymethyl)-1,3-propanediol; Tromethamine; Trometamol]

- Thoroughly established as an excellent biochemical buffer and basimetric standard.
- Does not precipitate calcium salts. Also of value in maintaining solubility of manganese salts.
- Sigma Chemical Company is the pioneer in Tris for laboratory use, offering the world's most complete stock of Tris compounds.

Trizma Base and Trizma HCl can be blended to produce any desired pH between 7 and 9 (Tris has a pK_a of 8.1 at 25°C). The Trizma mixing table presented here is reprinted from Sigma-Aldrich Technical Bulletin No. 106B.

The mixing table specifies the amounts of Trizma Base and Trizma HCl required to prepare 0.05 M buffer solutions at various pH and temperature conditions. To obtain the desired 0.05 M buffer, dissolve the indicated Trizma HCl (column 4) and Trizma Base (column 5) in 1 liter of water.

Trizma Base and Trizma HCl are somewhat hygroscopic at high humidities. For precise work and maximum accuracy, therefore, we recommend desiccating these materials before weighing and blending them. Our experience indicates that Trizma buffer solutions can be autoclaved.

Effects of Temperature on pH

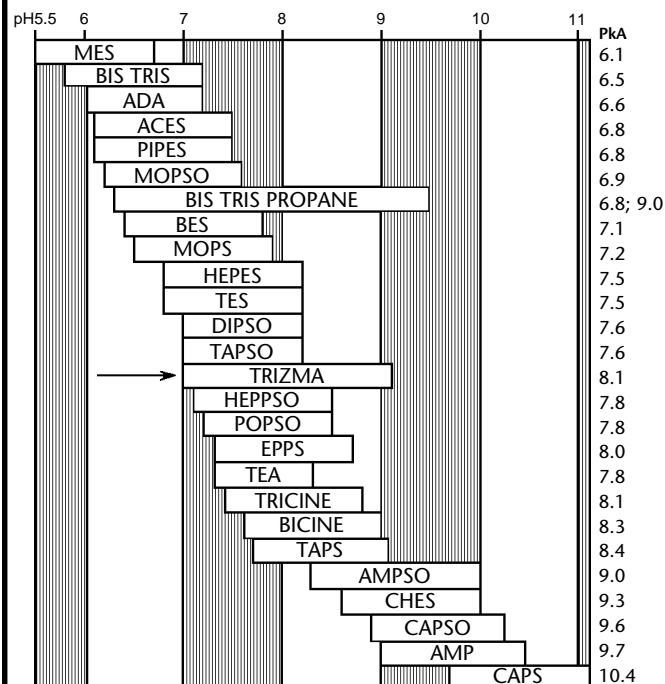
In general, as the solution decreases in temperature from 25°C to 5°C, the pH increases an average of 0.03 pH units per °C. As the solution increases in temperature from 25°C to 37°C, the pH decreases an average of 0.025 pH units per °C.

If Trizma components are thoroughly desiccated, it is possible to weigh the correct ratio and achieve a predicted pH with an accuracy of ± 0.05 . Thus, under careful conditions, the use of a pH meter for confirming the pH is unnecessary. The mixing table shows the proportions to use to obtain a desired pH.

Trizma Mixing Table (for 0.05M Solutions)

pH			Trizma HCl (Grams/Liter)	+	Trizma Base (Grams/Liter)
5°C	25°C	37°C			
7.76	7.20	6.91	7.02		0.67
7.89	7.30	7.02	6.85		0.80
7.97	7.40	7.12	6.61		0.97
8.07	7.50	7.22	6.35		1.18
8.18	7.60	7.30	6.06		1.39
8.26	7.70	7.40	5.72		1.66
8.37	7.80	7.52	5.32		1.97
8.48	7.90	7.62	4.88		2.30
8.58	8.00	7.71	4.44		2.65
8.68	8.10	7.80	4.02		2.97
8.78	8.20	7.91	3.54		3.34
8.88	8.30	8.01	3.07		3.70
8.98	8.40	8.10	2.64		4.03
9.09	8.50	8.22	2.21		4.36
9.18	8.60	8.31	1.83		4.65
9.28	8.70	8.42	1.50		4.90
9.36	8.80	8.51	1.23		5.13
9.47	8.90	8.62	0.96		5.32
9.56	9.00	8.70	0.76		5.47

Useful pH Range of Selected Biological Buffers (25°C, 0.1M)



794-0904

Trizma HCl in solution will produce a pH of approximately 4.7, but will have little if any buffering capacity. Trizma Base in solution will produce a pH of approximately 10.4, but will have little if any buffering capacity. Blending Trizma Base and Trizma HCl will produce any desired pH between 7 and 9, with a reasonable buffering capacity.

Trizma Base meets many of the requirements for a primary basimetric standard. It is pure, essentially stable, relatively non-hygroscopic and has a high equivalent weight. Trizma Base can be dried at 100°C for up to 4 hours. It can be used for the direct standardization of a strong acid solution; the equivalence point can be determined either potentiometrically or by use of a suitable indicator: [3-(4-Dimethylamino-1-naphthylazo)-4-methoxybenzenesulfonic acid].

Ordering Information:

Trizma Base, 99.8+%, reagent grade
(tris[hydroxymethyl]aminomethane)

(HOCH₂)₃CNH₂ FW 121.14

white crystalline powder

Primary standard and buffer.

mp 171.2-172.3° bp 219-220°/10mm

Assay ≥99.9% (titration) Water: 0.2% (max.)

A₂₉₀^{40%} (1cm path vs. H₂O): 0.05(max.) (Karl Fischer)

Heavy metals 2 ppm (max)

A 40% (w/v) solution is clear and colorless.

CAS No. [77-86-1] IRRITANT HYGROSCOPIC

25g	T1503A
100g	T1503B
250g	T1503C
500g	T1503D
1kg	T1503E
5kg	T1503F
10kg	T1503G

Trizma HCl, 99+%, reagent grade
(Tris[hydroxymethyl]aminomethane hydrochloride)

white crystalline powder

(HOCH₂)₃CNH₂•HCl

FW 157.60

mp 150-152° (dec.)

Assay ≥99% (min.)

(potentiometric titration)

A₂₉₀^{40%} (1cm path vs. H₂O): 0.05(max.)

0.0005% (max.)

A 40% (w/v) solution is clear and colorless.

Water: 0.5% (max.)

(Karl Fischer)

Heavy metal (as Pb).

CAS No. [1185-53-1]

IRRITANT

HYGROSCOPIC

100g	T3253A
250g	T3253B
500g	T3253C
1kg	T3253D
5kg	T3253E
10kg	T3253F

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Contact our Technical Service Department
(phone 800-359-3041 or 814-359-3041, FAX 800-359-3044
or 814-359-5468) for expert answers to your questions.

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